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CLASSIFICATION CHANGE

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ACCESSION NO. 61694-64

SID 63-143-10

~~SECRET~~ ACTUAL WEIGHT AND BALANCE REPORT

BOILERPLATE STACK NO. 15

SECOND VEHICLE FOR LAUNCH ENVIRONMENT (U)

CONTRACT NAS 9-150

PARAGRAPH 8.10, EXHIBIT I

ISSUED 15 MAY 1964



PREPARED BY

WEIGHT CONTROL GROUP

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SPACE and INFORMATION SYSTEMS DIVISION

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SECTION I

INTRODUCTION

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~~CONFIDENTIAL~~ACTUAL WEIGHT AND BALANCE REPORTFORBOILERPLATE STACK NO. 15SECOND VEHICLE FOR LAUNCH ENVIRONMENTINTRODUCTION

An actual weight and balance determination of Boilerplate Stack No. 15 components was conducted by the Apollo Weight Control Group at the Space and Information Systems Division of North American, Inc. The weight and center of gravity for the Command Module, Service Module and Insert/Adapter were obtained by weighing each assembly in two planes. The requirement for a weight and balance of the Launch Escape System at Downey was negated due to its inert configuration. Therefore, the data presented for the L.E.S. are based on calculated values. Actual weight and balance of the flight Launch Escape System will be obtained at the Atlantic Missile Range.

Attitudes of the module weighings along with the centers of gravity derived from each weighing is listed below. All weighings are witnessed by a NASA Representative.

<u>Assembly</u>	<u>Center of Gravity</u>
Command Module (Horizontal)	X
Command Module (Vertical)	Y and Z
Service Module (Horizontal)	X
Service Module (Vertical)	Y and Z
Insert/Adapter (Horizontal)	X
Insert/Adapter (Vertical)	Y and Z

The weights and centers of gravity derived were obtained by the use of two force measuring devices. The HL4-041 Revere CS-17 Force Indicator was used on the Service Module and the Insert/Adapter for both the horizontal and vertical positions. The AL4-154 Data Technology Digital Counter was used on the Command Module horizontal and vertical positions. Each system was calibrated for a compression and tension usage and a correction was made for calibration difference as well as corrections for standard gravity to local gravity. Buoyancy corrections were also accounted for.

The total orbital payload weight of 17000 pounds is the desired weight. The results achieved from the horizontal and vertical weighings of all components, plus the incorporation of known shortages and other weight and center of gravity modifications is 17234 pounds, as shown on Page 3. No ballast adjustments are presented in this report to derive the desired orbital payload weight. An addendum to this report will be made if any ballast adjustments are later required.

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All weight and center of gravity modifications made after the actual weight and balance determinations and recorded on the Weight Record Log, up to 1 May 1964, are included in this report. The modifications entered on the Weight Record Log after 1 May 1964 will be incorporated to the results of this report at the launch site.

The weight and center of gravity corrections made to the Net as weighed total, are indicated on Page 8 for the Command Module, Page 14 for the Service Module and Page 20 for the Insert/Adapter.

The weight breakdown summaries present the major functional groupings of structure and system weights of the various modules. A manufacturing variation is shown to indicate the difference of the actual weight from the calculated weight.

The dimensional diagram (Page 26) shows the relationship of the Apollo Spacecraft coordinate system with the Saturn I vehicle station and fin positions. The Apollo Spacecraft Xa stations have an origin 998.7 inches below the tangency of the Command Module structure mold line.

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SECTION II

MASS DATA SUMMARY

BOILERPLATE STACK NO. 15

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~~CONFIDENTIAL~~MASS DATA SUMMARYWEIGHT, CENTER OF GRAVITY AND INERTIABOILERPLATE STACK NO. 15

ITEM	WEIGHT	CENTER OF GRAVITY *			MOMENTS OF INERTIA (SLUG-FT ²)		
		Xa	Ya	Za	ROLL (X)	PITCH (Y)	YAW (Z)
Command Module	9463	1041.4	2.6	5.1	5660	4089	4036
Service Module	4167	950.9	0.9	0.3	4980	4173	4132
Insert/Adapter	3604	785.3	-2.9	-1.4	4474	4018	3965
TOTAL IN ORBIT PAYLOAD	17234	966.0	1.0	2.6	15161	49522	49361
Launch Escape System **	6597	1293.7	0.0	-0.2	255	9260	9262
TOTAL LAUNCH PAYLOAD	23831	1056.7	0.7	1.8	15426	169403	169237

NOTES: *The centers of gravity are based on the Apollo spacecraft coordinate system.
 Refer to the dimensional diagram (Page 26) for the relation of the Saturn I vehicle stations and the booster fin positions with the Apollo spacecraft coordinates.

**The Launch Escape System values are calculated.

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SECTION III

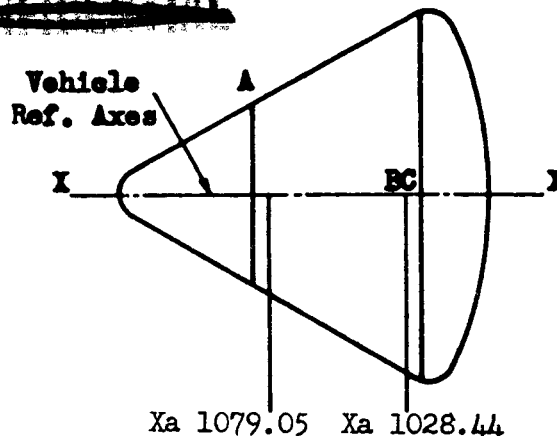
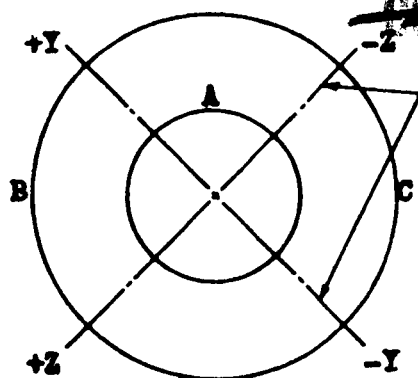
ACTUAL WEIGHT AND BALANCE

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WEIGHT AND BALANCE DATA SHEET

COMMAND MODULE - HORIZONTAL

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Vehicle No. Boilerplate No. 15

Recorded By G. W. Mann

Location Downey, California

Date Performed 21 April 1964

REACTION POINT A

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Red	10953	-300	10653	
2	Red	10906	-306	10600	
3	Red	10963	-298	10665	
					10639.3

REACTION POINT B

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Yellow	13105.5	-292	12813.5	
2	Yellow	13273.0	-300	12973	
3	Yellow	13350.5	-300.5	13050	
					12945.5

REACTION POINT C

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Blue	13839.0	-300	13539	
2	Blue	13736.0	-305.5	13430.5	
3	Blue	13608.5	-299	13309.5	
					13426.3

VERIFIED BY:

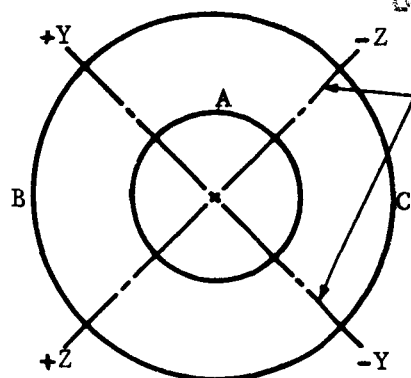
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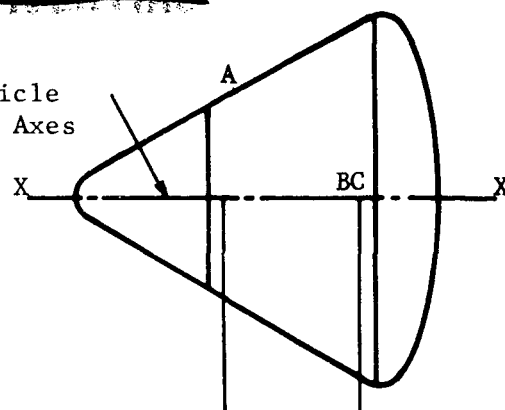
WEIGHT AND BALANCE CALCULATION SHEET

COMMAND MODULE - HORIZONTAL

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Vehicle
Ref. Axes



Xa 1079.05 Xa 1028.44

Recorded By G. W. Mann

Vehicle No. Boilerplate No. 15

Location Downey, California

Date Performed 21 April 1964

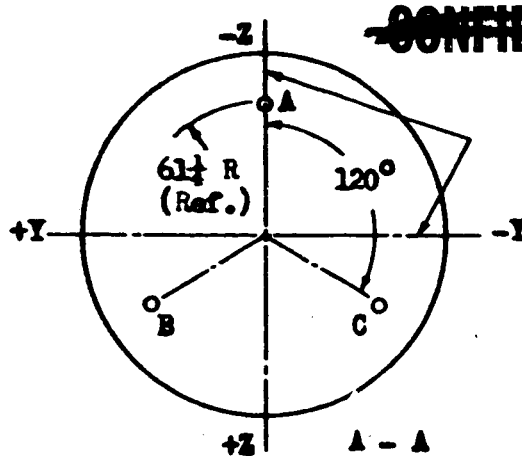
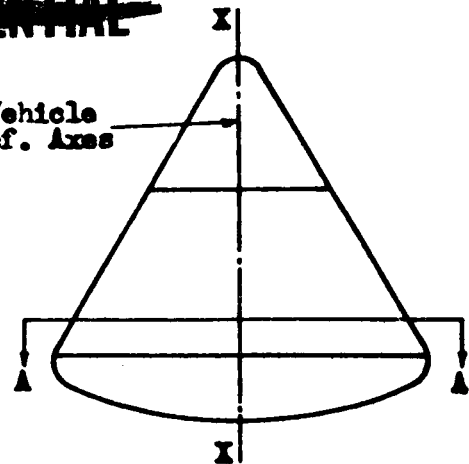
WEIGHT DERIVATION						
REACT POINT	LOAD CELL	AVERAGE READING	INDICATED WEIGHT	BUOYANCY CORRECTION	GRAVITY CORRECTION	WEIGHT
A	Red	10639.3	2672.7	-	+3.0	2675.7
B	Yellow	12945.5	3267.7	-	+3.7	3271.4
C	Blue	13426.3	3379.8	-	+3.8	3383.6

WEIGHT AND X CENTER OF GRAVITY				
DESCRIPTION	REACT POINT	WEIGHT	X STA	X MOMENT
Cell Location	A	2675.7	1079.05	2887214
Cell Location	B	3271.4	1028.44	3364439
Cell Location	C	3383.6	1028.44	3479830
GROSS (as weighed)		9330.7	1042.95	9731483
Less: Aft Jack Pads		-47.6	1028.44	-48954
Fwd. Jack Pad		-6.2	1079.05	-6690
Sling & Trunnions		-286.5	1079.05	-309148
Plus: Air Buoyancy		+5.0	1041.85	5209
NET (as weighed)		8995.4	1041.85	9371900
Total Corrections (Page 8)		+465.7	1031.80	480509
CORRECTED WEIGHT AND CG (X)		9461.1	1041.36	9852409

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WEIGHT AND BALANCE DATA SHEET

COMMAND MODULE - VERTICAL

Vehicle
Ref. AxesVehicle No. Boilerplate No. 15Recorded By J. HedgerLocation Downey, CaliforniaDate Performed 22 April 1964

REACTION POINT A

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Red	10856	0	10856	
2	Red	10875	0	10875	
3	Red	10871	0	10871	
					10867.3

REACTION POINT B

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Blue	13908	0	13908	
2	Blue	13911	0	13911	
3	Blue	13911	0	13911	
					13910.0

REACTION POINT C

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Yellow	12883	0	12883	
2	Yellow	12897	0	12897	
3	Yellow	12891	0	12891	
					12890.3

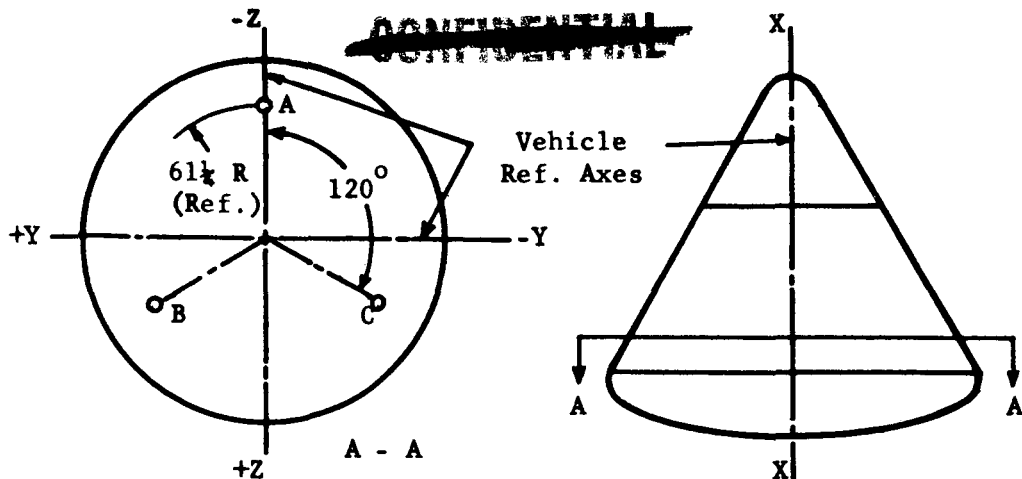
VERIFIED BY:

F. Pater
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WEIGHT AND BALANCE CALCULATION SHEET

COMMAND MODULE - VERTICAL



Vehicle No. Boilerplate No. 15

Recorded By G. W. Mann

Location Downey, California

Date Performed 22 April 1964

WEIGHT DERIVATION

REACT POINT	LOAD CELL	AVERAGE READING	INDICATED WEIGHT	BUOYANCY CORRECTION	GRAVITY CORRECTION	WEIGHT
A	Red	10867.3	2736.7	-	+3.1	2739.8
B	Yellow	13910.0	3501.8	-	+4.0	3505.8
C	Blue	12890.3	3253.7	-	+3.7	3257.4

WEIGHT AND Y - Z CENTER OF GRAVITY

DESCRIPTION	REACT POINT	WEIGHT	Y STA	Y MOMENT	Z STA	Z MOMENT
Cell Location	A	2739.8	0.00	0	-61.25	-167813
Cell Location	B	3505.8	53.12	186228	30.69	107593
Cell Location	C	3257.4	-53.05	-172805	30.66	99872
GROSS (as weighed)		9503.0	1.41	13423	4.17	39652
Less: HL4-017 Ring		-468.6	0.04	-19	0.00	0
G.S.E. Fittings (3)		-40.9	-10.23	418	9.49	-388
Plus: Air Buoyancy		+5.0	1.54	8	4.37	22
NET (as weighed)		8998.5	1.54	13830	4.37	39286
Total Corrections (Page 8)		+465.7	22.70	10571	19.20	8941
CORRECTED WEIGHT AND CG (Y-Z)		9464.2	2.58	24401	5.10	48227

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CORRECTIONS TO ACTUAL WEIGHT AND BALANCE

BOILERPLATE NO. 15

COMMAND MODULE

CORRECTIONS	WEIGHT	CENTER OF GRAVITY		
		Xa	Ya	Za
Water - Glycol (All)	+ 278.5	1033.6	35.2	14.7
(4) Batteries 1.1.1.1.0	+ 31.2	1021.0	18.0	38.6
(1) Battery 1.1.1.3.0	+ 52.0	1022.5	6.0	38.6
(1) Battery 1.1.1.3.0	+ 52.0	1022.5	-7.4	38.6
*(1) Commutator 3.1.2.1.1	+ 8.6	1039.6	-28.2	3.1
*(1) Transponder 4.4.2.1.1	+ 11.6	1040.4	21.7	43.4
(1) Sequencer BL6-451202-101	+ 19.0	1055.0	40.0	-7.0
(1) Dummy Air Vent BL6-317051	+ 3.7	1021.1	-27.0	-72.1
(1) Nitrogen Purge Line FT 2014	+ 6.0	1043.7	-27.6	4.0
*(1) Low Pressure Filter	+ 0.4	1030.0	-31.5	36.0
Tension Ties(Partial)BL7-550003	+ 6.9	1022.0	-33.0	-30.6
Attach Bolts-L.E.S.Tower (Partial)	+ 3.4	1080.9	0.0	0.0
Wiring	+ 1.0	1025.0	0.0	15.0
*Coax Cable BL6-710104-91	+ 0.4	1040.4	19.0	51.4
*(2) Mockup Batteries RL4-750022	- 9.0	1022.5	-0.7	38.6
TOTAL CORRECTIONS	+ 465.7	1031.8	22.7	19.2

NOTE: *Actual weight of items entered on the Weight Record Log up to 1 May 1964.

All other items are calculated weights for known shortages.

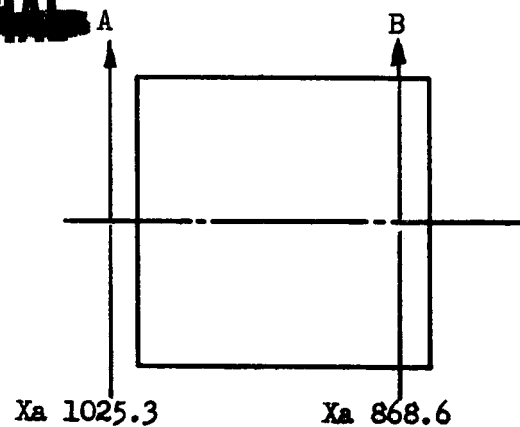
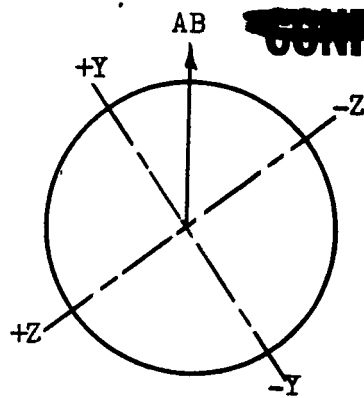
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~~CONFIDENTIAL~~WEIGHT AND CENTER OF GRAVITY SUMMARYBOILERPLATE NO. 15COMMAND MODULE

ITEM	WEIGHT	CENTER OF GRAVITY		
		Xa	Ya	Za
Horizontal Weighing (Page 5)	9461.1	1041.36		
Vertical Weighing (Page 7)	9464.2		2.58	5.10
COMMAND MODULE (Average)	9463	1041.4	2.6	5.1

WEIGHT AND BALANCE DATA SHEET

SERVICE MODULE - HORIZONTAL

Vehicle No. Boilerplate No. 15Recorded By J. A. HughesLocation Downey, CaliforniaDate Performed 27 February 1964

REACTION POINT A

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Red	2588	-2	2586	
2	Red	2574	+8	2582	
3	Red	2588	0	2588	
					2585.3

REACTION POINT B

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Blue	3731	0	3731	
2	Blue	3738	+3	3741	
3	Blue	3738	-4	3734	
					3735.3

REACTION POINT

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING

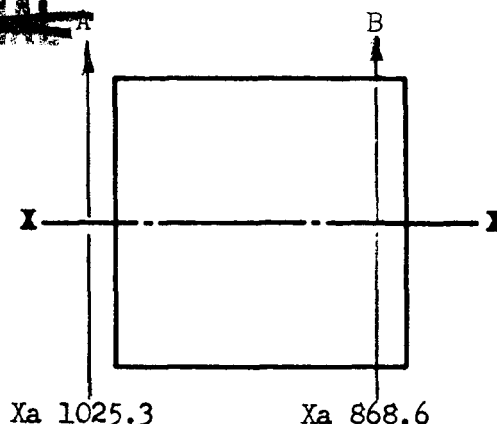
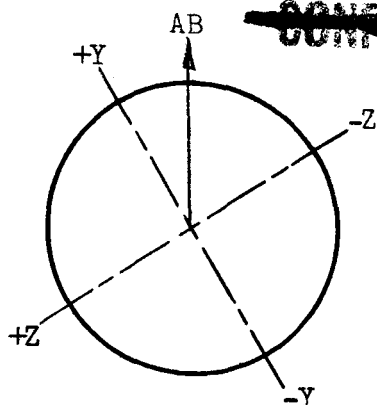
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WEIGHT AND BALANCE CALCULATION SHEET

SERVICE MODULE - HORIZONTAL



Vehicle No. Boilerplate No. 15

Recorded By J. F. Kessler

Location Downey, California

Date Performed 27 February 1964

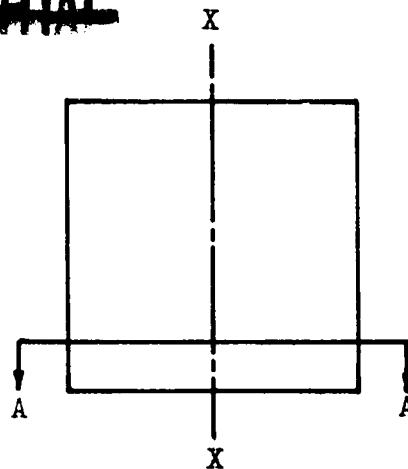
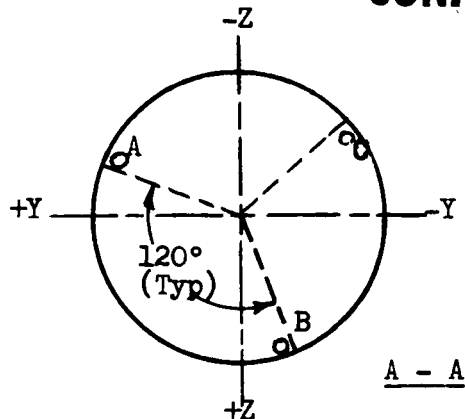
WEIGHT DERIVATION						
REACT POINT	LOAD CELL	AVERAGE READING	INDICATED WEIGHT	BUOYANCY CORRECTION	GRAVITY CORRECTION	WEIGHT
A	Red	2585.3	+0.4	-	+2.9	2588.6
B	Blue	3735.3	-0.6	-	+4.2	3738.9

WEIGHT AND X CENTER OF GRAVITY				
DESCRIPTION	REACT POINT	WEIGHT	X STA	X MOMENT
Cell Location	A	2588.6	1025.3	2654092
Cell Location	B	3738.9	868.6	3247609
GROSS (as weighed)		6327.5	932.7	5901701
Less: Forward Beam Assy.		-230.0	1010.5	-232415
Aft Beam		-573.0	862.0	-493926
Plus: Air Buoyancy		+2.0	938.0	1876
NET (As weighed)		5526.5	936.8	5177236
Total Corrections (Page 14)		-1352.6	893.2	-1208142
CORRECTED WEIGHT AND X CG		4173.9	950.9	3969094

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WEIGHT AND BALANCE DATA SHEET

SERVICE MODULE - VERTICAL

~~CONFIDENTIAL~~Vehicle No. Boilerplate No. 15Recorded By J. A. HughesLocation Downey, CaliforniaDate Performed 27 February 1964

REACTION POINT A

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Yellow	1802	0	1802	
2	Yellow	1786	+3	1789	
3	Yellow	1781	+3	1784	
					1791.7

REACTION POINT B

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Red	1770	0	1770	
2	Red	1773	+3	1776	
3	Red	1775	+3	1778	
					1774.7

REACTION POINT C

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Blue	2164	-2	2162	
2	Blue	2159	0	2159	
3	Blue	2159	+1	2160	
					2160.3

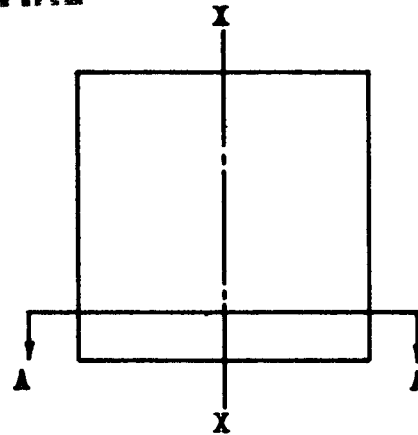
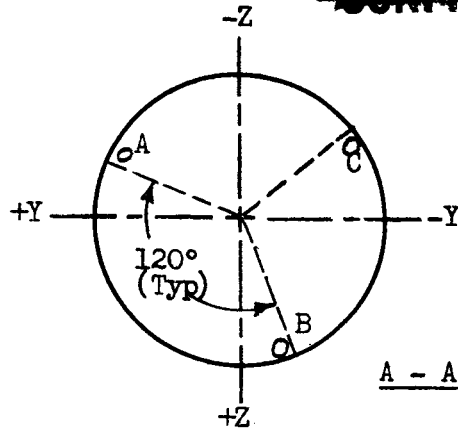
VERIFIED BY: J. A. Hughes

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WEIGHT AND BALANCE CALCULATION SHEET

SERVICE MODULE - VERTICAL

~~CONFIDENTIAL~~Vehicle No. Boilerplate No. 15Recorded By J. E. KesslerLocation Downey, CaliforniaDate Performed 27 February 1964

WEIGHT DERIVATION

REACT POINT	LOAD CELL	AVERAGE READING	INDICATED WEIGHT	BUOYANCY CORRECTION	GRAVITY CORRECTION	WEIGHT
A	Yellow	1791.7	+0.5	-	+2.0	1794.2
B	Red	1774.7	+3.7	-	+2.0	1780.4
C	Blue	2160.3	+5.1	-	+2.4	2167.8

WEIGHT AND Y - Z CENTER OF GRAVITY

DESCRIPTION	REACT POINT	WEIGHT	Y STA	Y MOMENT	Z STA	Z MOMENT
Cell Location	A	1794.2	71.81	128842	-23.34	-41877
Cell Location	B	1780.4	-15.69	-27934	73.86	131500
Cell Location	C	2167.8	-56.12	-121657	-50.52	-109517
GROSS (as weighed)		5742.4	-3.61	-20749	-3.46	-19894
Less: Forward Beam Assy.		-230.0	0.00	0	0.00	0
Reaction Pads		-2.0	0.00	0	0.00	0
Plus: Air Buoyancy		+2.0	-3.61	-7	-3.46	-7
NET (as weighed)		5512.4	-3.77	-20756	-3.61	-19901
Total Corrections (Page 14)		-1352.6	-18.2	24617	-15.6	21101
CORRECTED WEIGHT AND CG (Y-Z)		4159.8	0.93	3861	0.29	1200

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CORRECTIONS TO ACTUAL WEIGHT AND BALANCE

BOILERPLATE NO. 15

SERVICE MODULE

CORRECTIONS	WEIGHT	CENTER OF GRAVITY		
		Xa	Ya	Za
(4) B17-320040 Plates	+ 6.0	1004.1	0.0	0.0
(4) B17-320031-3 Bolts & Nuts	+ 24.0	1006.7	0.0	0.0
B17-550003 Tension Ties (Partial)	+ 11.0	1003.0	0.0	0.0
B17-320101 Umbilical Fairing	+ 17.0	1007.0	24.0	-74.0
*Tare Book Corrections (To 5-1-64)	+ 31.4	959.0	0.0	0.0
*Tare Book Ballast Corrections	-1442.0	899.2	-16.8	-15.5
TOTAL CORRECTIONS	-1352.6	893.2	-18.2	-15.6

NOTE: *Actual weight of items entered on the
Weight Record Log up to 1 May 1964.

All other items are calculated weights
for known shortages.

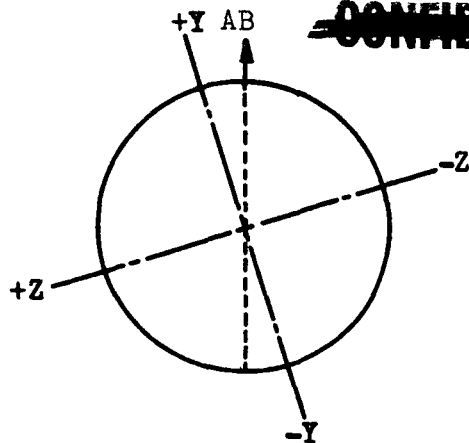
~~CONFIDENTIAL~~WEIGHT AND CENTER OF GRAVITY SUMMARYBOILERPLATE NO. 15SERVICE MODULE

ITEM	WEIGHT	CENTER OF GRAVITY		
		Xa	Ya	Za
Horizontal Weighing (Page 11)	4173.9	950.9		
Vertical Weighing (Page 13)	4159.8		0.93	0.29
SERVICE MODULE (Average)	4167	950.9	0.9	0.3

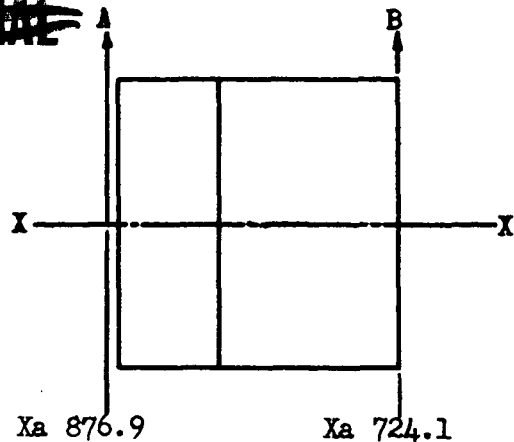
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WEIGHT AND BALANCE DATA SHEET

INSERT & ADAPTER - HORIZONTAL



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Vehicle No. Boilerplate No. 15

Recorded By G. W. Mann

Location Downey, California

Date Performed 24 February 1964

REACTION POINT A

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Red	1776	+6	1782	
2	Red	1778	-2	1776	
3	Red	1764	-6	1758	
					1772.0

REACTION POINT B

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Blue	2904	+8	2912	
2	Blue	2913	+6	2919	
3	Blue	2934	+3	2937	
					2922.6

REACTION POINT

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING

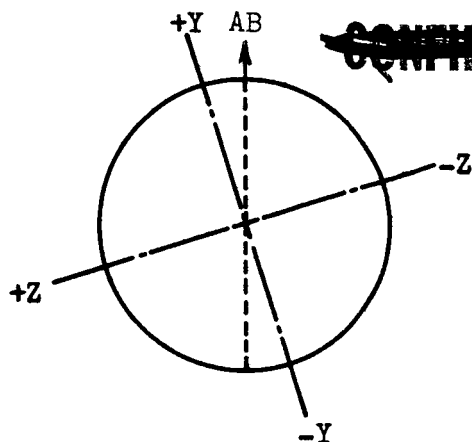
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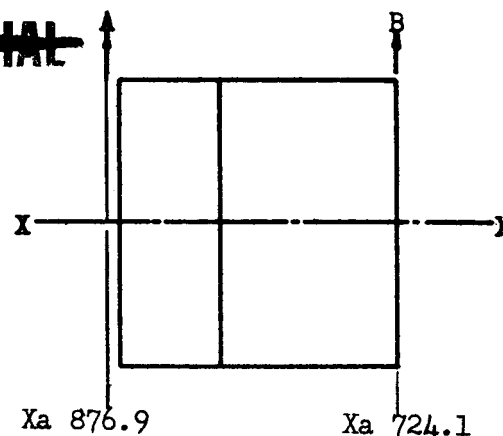
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WEIGHT AND BALANCE CALCULATION SHEET

INSERT & ADAPTER - HORIZONTAL



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Vehicle No. Boilerplate No. 15

Recorded By J. F. Kessler

Location Downey, California

Date Performed 24 February 1964

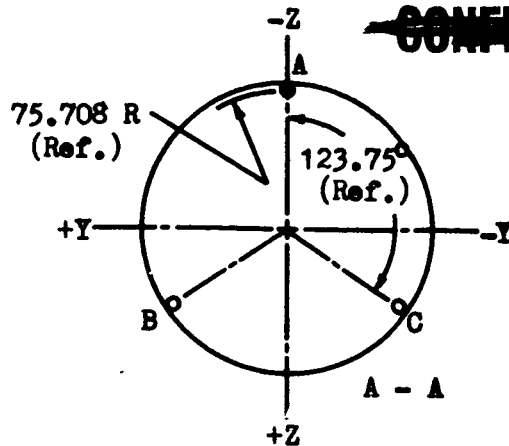
WEIGHT DERIVATION						
REACT POINT	LOAD CELL	AVERAGE READING	INDICATED WEIGHT	BUOYANCY CORRECTION	GRAVITY CORRECTION	WEIGHT
A	Red	1772.0	+1.1	-	+2.0	1775.1
B	Blue	2922.6	+0.9	-	+3.3	2926.8

WEIGHT AND X CENTER OF GRAVITY				
DESCRIPTION	REACT POINT	WEIGHT	X STA	X MOMENT
Cell Location	A	1775.1	876.9	1556585
Cell Location	B	2926.8	724.1	2119296
GROSS (as weighed)		4701.9	781.8	3675881
Less: Forward Beam		-231.0	870.9	-201178
Aft Beam		-573.0	717.4	-411070
Aft Plates & Hdwr.		-41.0	721.8	-29594
Plus: Air Buoyancy		+1.0	785.1	785
NET (as weighed)		3857.9	786.7	3034824
Total Corrections (Page 20)		-249.9	806.4	-201519
CORRECTED WEIGHT AND X CG		3608.0	785.3	2833305

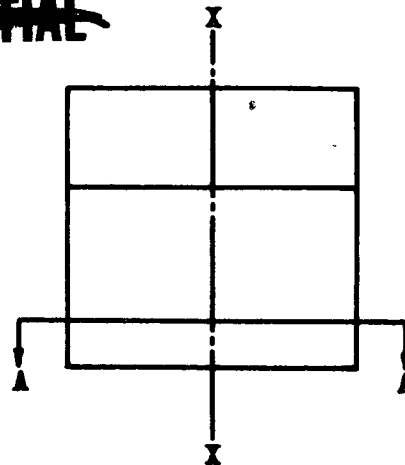
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WEIGHT AND BALANCE DATA SHEET

INSERT & ADAPTER - VERTICAL



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Vehicle No. Boilerplate No. 15

Recorded By K. L. Beets

Location Downey, California

Date Performed 24 February 1964

REACTION POINT A

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Yellow	1366	-2	1364	
2	Yellow	1358	-2	1356	
3	Yellow	1358	-2	1356	
					1358.7

REACTION POINT B

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Red	1418	-2	1416	
2	Red	1412	-2	1410	
3	Red	1412	-2	1410	
					1412.0

REACTION POINT C

DETERMINATION NUMBER	LOAD CELL	GROSS READING	ZERO READING	CORRECTED READING	AVERAGE READING
1	Blue	1308	-6	1302	
2	Blue	1298	-2	1296	
3	Blue	1298	-4	1294	
					1297.3

VERIFIED BY: [Signature]

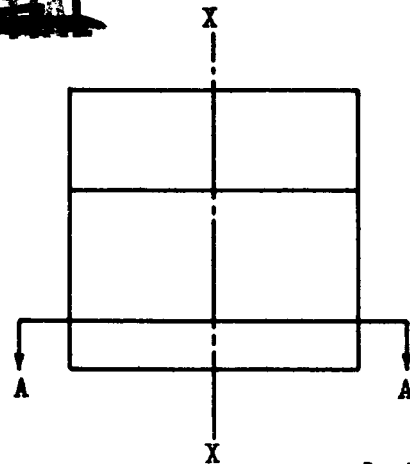
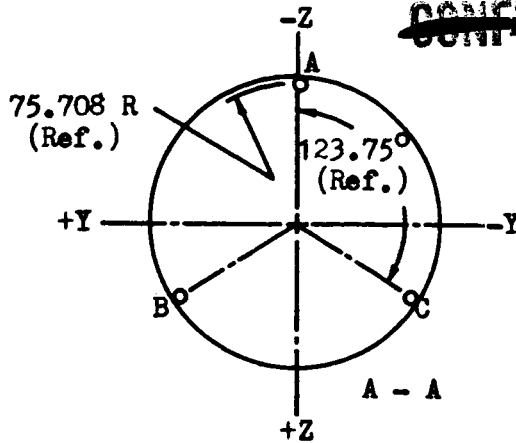
NASA

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WEIGHT AND BALANCE CALCULATION SHEET

INSERT & ADAPTER - VERTICAL

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Vehicle No. Boilerplate No. 15

Recorded By J. F. Kessler

Location Downey, California

Date Performed 24 February 1964

WEIGHT DERIVATION						
REACT POINT	LOAD CELL	AVERAGE READING	INDICATED WEIGHT	BUOYANCY CORRECTION	GRAVITY CORRECTION	WEIGHT
A	Yellow	1358.7	+1.8	-	+1.5	1362.0
B	Red	1412.0	+3.2	-	+1.6	1416.8
C	Blue	1297.3	+4.6	-	+1.5	1303.4

WEIGHT AND Y - Z CENTER OF GRAVITY						
DESCRIPTION	REACT POINT	WEIGHT	Y STA	Y MOMENT	Z STA	Z MOMENT
Cell Location	A	1362.0	0.00	0	-75.71	-103117
Cell Location	B	1416.8	62.95	89188	42.06	59591
Cell Location	C	1303.4	-62.95	-82049	42.06	54821
GROSS (as weighed)		4082.2	1.75	7139	2.77	11295
Less: Forward Beam		-231.0	0.00	0	0.00	0
Reaction Pads		-2.0	0.00	0	0.00	0
Plus: Air Buoyancy		+1.0	0.00	0	0.00	0
NET (as weighed)		3850.2	1.85	7139	2.93	11295
Total Corrections (Page 20)		-249.9	70.00	-17493	65.30	-16318
CORRECTED WEIGHT AND CG (Y-Z)		3600.3	-2.88	-10354	-1.40	-5023

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~~CONFIDENTIAL~~CORRECTIONS TO ACTUAL WEIGHT AND BALANCEBOILERPLATE NO. 15INSERT/ADAPTER

CORRECTIONS	WEIGHT	CENTER OF GRAVITY		
		Xa	Ya	Za
Additional Adapter Paint	+ 14.0	768.0	0.0	0.0
B18-320133 Airconditioning Barrier	+ 39.2	725.0	0.0	0.0
B18-320033-3 Plates	+ 18.4	722.0	0.0	0.0
*Tare Book Corrections (Thru 5-1-64)	+ 3.5	775.0	0.0	0.0
*Tare Book Ballast Corrections	- 325.0	789.8	53.8	50.2
TOTAL CORRECTIONS	- 249.9	806.4	70.0	65.3

NOTE: *Actual weight of items entered on the Weight
Record Log up to 1 May 1964.

All other items all calculated weights for
known shortages.

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~~CONFIDENTIAL~~WEIGHT AND CENTER OF GRAVITY SUMMARYBOILERPLATE NO. 15INSERT/ADAPTER

ITEM	WEIGHT	CENTER OF GRAVITY		
		Xa	Ya	Za
Horizontal Weighing (Page 17)	3608.0	785.3		
Vertical Weighing (Page 19)	3600.3		-2.88	-1.40
INSERT/ADAPTER (Average)	3604	785.3	-2.9	-1.4

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SECTION IV

WEIGHT BREAKDOWN SUMMARY

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~~CONFIDENTIAL~~WEIGHT BREAKDOWN SUMMARYLAUNCH ESCAPE SYSTEMBOILERPLATE NO. 15

Structure		975
Motor Structure and Assembly	504	
Tower Structure-Less Insulation	289	
Tower Insulation	182	
Instrumentation		2
Electrical System		82
Propulsion System		5340
Escape Motor	1570	
Escape Motor Propellant (Live)	3197	
Jettison Motor (Live)	526	
Pitch Motor (Live)	47	
Separation Provisions		15
Ballast		183

LAUNCH ESCAPE SYSTEM WEIGHT 6597

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~~CONFIDENTIAL~~WEIGHT BREAKDOWN SUMMARYCOMMAND MODULEBOILERPLATE NO. 15

Structure

Basic Structure	4981
Structure-Less Ablator and Insulation	4534
Ablator	147
Internal Insulation	300
Secondary Structure	2989
Internal Ballast	2614
Equipment Racks and Supports	284
Coldplates	80
Tension Ties (Partial)	11
Stabilization and Control	7
Environmental Control	614
Instrumentation	208
Electrical Power System	410
Communications	155
Manufacturing Variation	99

COMMAND MODULE WEIGHT

9463

~~CONFIDENTIAL~~WEIGHT BREAKDOWN SUMMARYSERVICE MODULEBOILERPLATE NO. 15

Structure

Basic Structure		3700
Secondary Structure		11
Tension Ties (Partial)	11	
Environmental Control		10
Instrumentation		51
Electrical Power System		77
Reaction Control System (Dummy)		240
Communications		22
Manufacturing Variation		56

SERVICE MODULE WEIGHT

4167~~CONFIDENTIAL~~

~~CONFIDENTIAL~~WEIGHT BREAKDOWN SUMMARYINSERT/ADAPTERBOILERPLATE NO. 15

Structure

Basic Structure	3274
Structure - Insert	1153
Structure - Adapter	2121
Secondary Structure	284
Internal Ballast	245
Airconditioning Barrier	39
Instrumentation	14
Electrical Power System	24
Manufacturing Variation	8

INSERT/ADAPTER WEIGHT	3604
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SECTION V

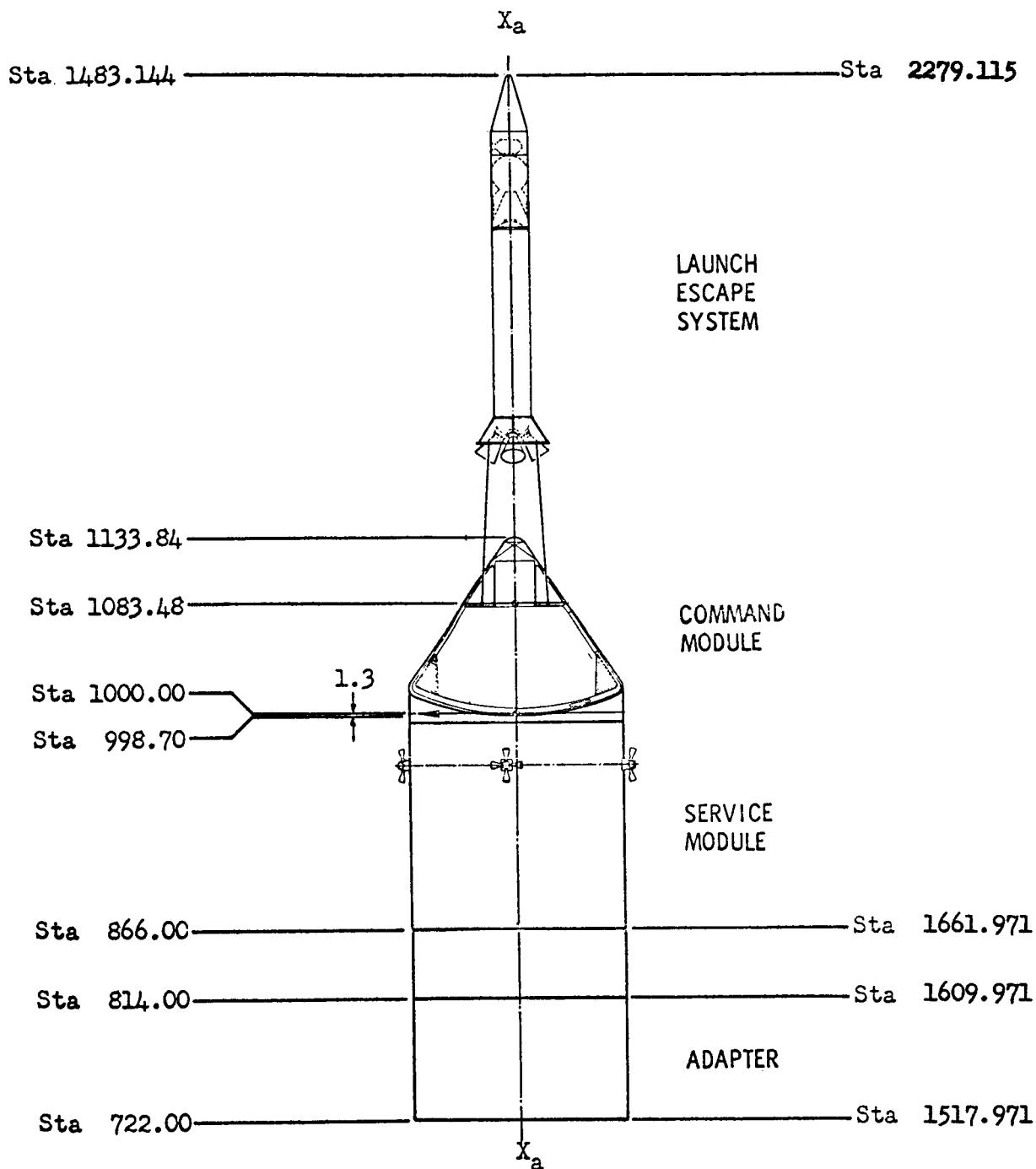
DIMENSIONAL DIAGRAM

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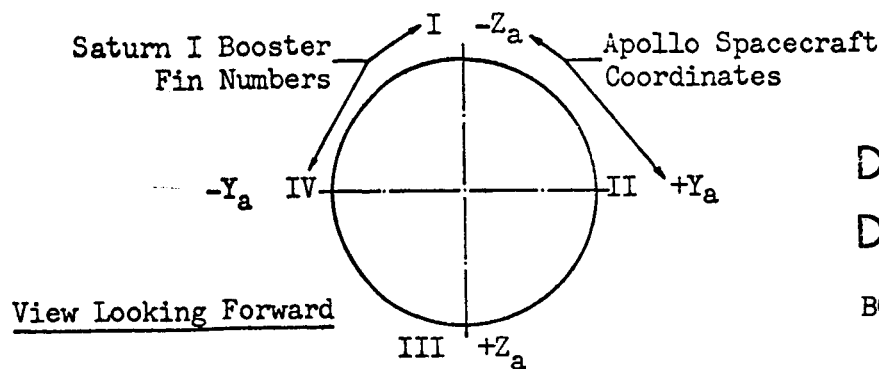


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X_a - Apollo Spacecraft Stations



Saturn I Vehicle Stations



DIMENSIONAL DIAGRAM

BOILERPLATE NO. 15